WisDOT RD&T Home

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Putting Research to Work

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Technical information for state DOT highway professionals
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Research World

Wisconsin Well Represented at TRB Annual Meeting

More than 35 Wisconsin university investigators and WisDOT staff are scheduled to make presentations at the Transportation Research Board Annual Meeting this month in Washington, D.C. Papers include research supported by the Wisconsin Highway Research Program and the Midwest Regional University Transportation Center. For presentation descriptions, days, times and meeting room locations, see the *Wisconsin Guide* to the TRB 84th Annual Meeting at http://www.dot.wisconsin.gov/library/research/docs/annualreports/trbguide2005.pdf.

Guidelines for Ash, Asphalt, Building Materials in Base Courses

The Danish Road Institute has published four new reports on the use of recycled materials in base courses. Materials considered include ash, reclaimed asphalt pavement, and building demolition materials like crushed concrete, asphalt and bricks. See page 24 of the latest issue of *Nordic Road & Transport* at http://www.vti.se/Nordic/pdf/304.pdf.

UK Launches Transportation Research Centers

The UK's Department of Trade and Industry is investing £15 million ($28.8 million) to set up two research centers that will bring government, manufacturers and academia together to develop technologies to improve traffic flow, reduce reliance on fossil fuels, and improve fuel efficiency. Read the article in *EETimesUK* at http://www.eetuk.com/tech/news/showArticle.jhtml?articleID=56200225.

French Photo Radar Reduces Roadway Fatalities 50%

A report by France's Transport Ministry credits the country's new network of more than 280 mobile and fixed photo radar units with a 50% reduction in fatalities and an 85% drop in crashes at targeted areas of dangerous roadways. Some U.S. cities are using similar technology; see http://www.stopredlightrunning.com/html/newsrelease_122004.htm.

Research Explores Wireless Car-to-Car Networking for Safety

The Car2Car Communication Consortium (http://www.car-to-car.org/) aims to establish a European standard for wireless car-to-car communications. With the help of this technology, Europe's auto industry plans to increase road traffic safety and efficiency while developing new on-board information services and applications. The consortium hopes to have prototypes by mid-2005. Read the Techworld article at http://www.techworld.com/mobility/news/index.cfm?NewsID=2836.

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Previous issues are available at http://www.dot.wisconsin.gov/library/publications/format/newsletters/rdt.htm.

Other e-newsletters for transportation professionals:
TRB E-Newsletter from the Transportation Research Board: http://gulliver.trb.org/news/.
The AASHTO Journal from the American Association of State Highway and Transportation Officials: http://www.transportation.org/publications/journal.nsf.
CTS Research E-News from the University of Minnesota: http://www.cts.umn.edu/publications/enews/.
Texas Transportation Researcher from TAMU's Texas Transportation Institute: http://tti.tamu.edu/researcher/.
Austroads Newsletter from Austroads: http://www.austroads.com.au/austroads_newsletter.html.
Transportation Communications Newsletter: http://groups.yahoo.com/group/transport-communications/.

Designing for the Future

'Fly-By' Ramps Enhance Nebraska Roundabout

A new roundabout in Blair, Neb., features a unique design: Fly-by ramps divert a majority of traffic away from the three-way intersection, including all right turns and some through traffic. Located at the intersection of two major highways, the roundabout is designed to accommodate trucks and other large vehicles. See page 4 of NDOR's Roadrunner newsletter at http://www.dor.state.ne.us/roadrunner/docs/Dec04Jan05.pdf.

Safer Expressway Intersections

At-grade intersections of divided highways and side roads can be prone to crashes. In addition to conventional solutions such as signage and signalization, Iowa State University researchers have identified 17 alternative safety improvements. They include two-movement cues, wider medians, left-turn acceleration lanes, and indirect left-turn designs. Read more in Tech News newsletter at http://www.ctre.iastate.edu/pubs/tech_news/2004/nov-dec/expressway_intersections.htm; the final report will be available online this month.

Update on FHWA's CSD Activities

FHWA has posted a report on the current and recently completed activities of its Context-Sensitive Solutions program, including upcoming design guides, training courses, workshops and conferences, and research in progress. See http://www.fhwa.dot.gov/csd/activities.htm, and visit FHWA's Context-Sensitive Design Web site at http://www.fhwa.dot.gov/csd/ for links to CSD resources and information about state DOTs' CSD practices..

Short on Space, RIDOT Looks Inward for Bridge Solution

When Rhode Island DOT discovered that a crucial bridge in Providence needed to be replaced, engineers designed an innovative solution: Build a new five-lane bridge in the 45-foot gap between the existing eastbound and westbound spans. This plan avoids costly right-of-way acquisition, and construction impacts on traffic will be minimal. In addition, the department will preserve part of the original structure as a scenic bicycle and pedestrian route. Read more in the latest issue of *Public Roads* at http://www.tfhrc.gov/pubrds/04sep/02.htm.

Less Is More: Designing Safer Streets

Traffic engineers in the U.S. and abroad are removing traffic signals and lane markings and narrowing streets in an effort to make drivers slow down and pay attention to their surroundings. In Florida, the changes have led to fewer accidents and shorter trip times, and a UK study found that drivers with no center line to guide them had 35% fewer accidents. Read the article in *Wired* magazine at http://www.wired.com/wired/archive/12.12/traffic.html.

Innovative Detour Roadway Minimizes Traffic Disruption

A temporary detour roadway built over water recently netted New York State DOT the Overall Project of the Year award from *New York Construction* magazine. Engineers created a 22-pier detour bridge, intended to last 10 years, that is allowing FDR Drive to be rehabilitated with minimal traffic disruption. The project includes a fender system in the river to guide errant ships away from the detour road. See http://www.dot.state.ny.us/news/awards/1214a.shtml.

Study of Cherokee Site Earns National Award for Georgia Team

A study of New Echota, the first and last capital of the Cherokee Nation, has earned Georgia DOT an award from the National Partnership for Highway Quality. The Traditional Cultural Property study, performed by GDOT and FHWA, will aid in long-term planning for transportation projects near the site. The tribal consulting process was filmed to help other agencies undertaking similar projects. See http://www.dot.state.ga.us/dot/communications/gdotnews/documents/pdf/pressrelease/georgiapartnering.pdf.

Construction and Materials Innovations

Wisconsin Firms Lauded for Asphalt Innovation

Two Wisconsin companies were awarded the Wisconsin Asphalt Pavement Association's 2004 Innovation Award last month for successfully developing an asphalt mix design that uses a glass aggregate produced from paper mill sludge. OMNNI Associates of Appleton developed a hot-mix asphalt design using glass aggregate developed by Minergy Corp. of Neenah. WisDOT has verified the asphalt pavement for use in its construction projects. Read the press release at http://www.omnni.com/News.asp?ID=41.

Optimizing Concrete Curing Practices

In a new Tech Transfer Summary, the Center for Portland Cement Concrete Pavement Technology shares the results of a study on optimizing curing of concrete pavements. Researchers cite weather as the most important factor in curing compound effectiveness, advocate single layers of certain compounds, and find that water absorption tests are best for understanding near-surface properties. See http://www.ctre.iastate.edu/pubs/t2summaries/curing.pdf.

Curved Steel Bridge Girder Erection No Picnic

Use of curved steel bridge girders presents a variety of construction challenges, such as proper plumb lining and detailing in the field. Described in the American Society of Highway Engineers' recent Scanner newsletter, these complications need to be considered by designers as well as builders. See http://www.highwayengineers.org/scanner120804g.html.

LTPP Still a Key Data Source

The 17-year-old Long-Term Pavement Performance program continues to provide critical data for building better highways. In addition to being the single largest data source for development of the new AASHTO Mechanistic-Empirical Design Guide, LTPP products aid FWD calibration, analysis of freeze-thaw cycles and much more. See the 2004 year-in-review for highlights and publications at http://www.tfhrc.gov/pavement/ltpp/reports/04125/index.htm.

Best Practices in Working with Aggregate Base Courses

Iowa State University's Center for Transportation Research and Education recently reported on a study of optimum characteristics of pavement bases. Recommendations include delivering aggregate wet to prevent settling of fine aggregate particles, placing aggregate base course transversely rather than longitudinally, and using recycled PCC base sparingly. See the summary at http://www.ctre.iastate.edu/pubs/Tech_News/2004/nov-dec/optimize_bases.htm and the final report at http://www.ctre.iastate.edu/reports/tr482.pdf.

PennDOT Research Finds Several Uses for Recycled Tires

AASHTO recently posted a report on Pennsylvania DOT research on using recycled tires in highway projects. Recommendations include using shreds in embankment fills above water tables, and alternately layering conventional soils and shreds for greater stability. The research provides gradation suggestions for pavement use; cleanliness guidelines; and metal content limitations. Read the summary at http://www4.nationalacademies.org/trb/scor/states.nsf/a34ffb91753b26c485256ada0048be6e/6a4001fe9aa89e1e85256b1100627518?OpenDocument.

Polyurethane Fills Voids in Soil

Uretek USA has issued a white paper on deep injection of high-density polyurethane for soil stabilization and pavement lifting. After injection, the polymer expands to fill subsurface voids, then cures into a solid base material. WisDOT completed a study of the material in 2003; see page 19 of the RD&T Annual Report at http://www.dot.wisconsin.gov/library/research/docs/annualreports/annualreport2003.pdf. Read the white paper at http://www.pavement.com/onthegrade/2004/uretek.pdf. Courtesy of Concrete Pavement Progress newsletter.

Operating/Optimizing the System

WisDOT Environmental Stewardship Efforts Featured in NCHRP Report

The National Cooperative Highway Research Program's Compendium of Environmental Stewardship Practices in Construction and Maintenance pulls together best practices from state DOTs in protecting the environment while conducting maintenance and construction activities. The report highlights several WisDOT operations efforts, including its mowing policy, right-of-way maintenance protecting butterfly habitats, and implementation of advanced technology in winter operations. See the full report at http://environment.transportation.org/research_news/nchrp/NCHRP-25-25-04.pdf.

Mn/DOT Tests Experimental Snow Fence

Minnesota DOT installed an experimental snow fence in December that stands 10 feet tall and spans 350 feet. Webbed fencing is fastened to 12-foot steel beams installed into sleeves set into concrete in the median ditch. The design of the fence allows it to be adjusted for conditions, easily replaced and quickly removed in the spring. Read the press release at http://www.dot.state.mn.us/metro/news/04/12/07i94_i694.html.

VDOT Cracks Down on Trucks to Keep Tunnel Traffic Moving

Virginia DOT and the Virginia State Police are hoping to put the brakes on oversized trucks clogging up traffic on Interstate 64. A new plan will educate drivers about height restrictions at the Hampton Roads Bridge-Tunnel and aggressively ticket truckers who ignore the rules. An additional height sensor will tell drivers how high they're riding in plenty of time to reroute if their trucks are too tall. Read more in the *Daily Press* (Newport News, Va.) at http://www.dailypress.com/news/dp-33507sy0dec23,0,5349307.story. Courtesy of Transportation Communications Newsletter.

Software Helps CDOT Increase Ramp Meter Efficiencies

By implementing VISSIM, a visual simulation program, Colorado DOT officials can easily determine whether ramp metering will be an effective tool at specific interchanges. The program projects speed increases and trip time decreases. Read more about the program in CoTrip Quarterly newsletter at http://www.cotrip.org/cotrip_quarterly/current/feature.htm.

Viking Region Seeks to Increase VMS Uniformity

A study by the Technical Research Centre of Finland examines the use and appearance of variable message signs in the Viking region of Europe. The research aims to increase the conformity and efficiency of the messages displayed on signs in Denmark, Finland, Norway, Sweden and parts of northern Germany. Read about the research on page 4 of *Nordic Road & Transport Research* at http://www.vti.se/Nordic/pdf/304.pdf.

Study Recommends Lighting Up Rural Intersections

Using comparative and before and after analyses, a study by the Center for Transportation Research and Education at Iowa State University studied Minnesota's rural intersection crash data to determine whether lighting reduces the number of nighttime crashes. The examination of more than 3,600 intersections suggests that installing street lighting does reduce nighttime crash rates. See http://www.ctre.iastate.edu/reports/rural_lighting_draft.pdf.

ODOT Tests Inlaid Pavement Markings

Oregon DOT is waving its white flag and declaring Old Man Winter the winner over pavement paint. Rather than fighting back every year with fresh waterborne paint striping to replace markings worn away by snow plows, graders, tire chains and studded tires, ODOT is experimenting with inlaid durable pavement markings. Read how test decks are performing at http://www.oregon.gov/ODOT/TD/TP_RES/research_notes/rsn05-04.pdf.

Safe Travel/Smart Travel

Sharing Incident Data via ITS

U.S. DOT and Utah DOT are partnering to test the integration of computer-aided dispatch technologies with ITS to expedite emergency roadway services. Researchers believe that ITS technology has the potential to facilitate and accelerate incident data sharing among public agencies, enabling police, fire and transportation agencies to provide faster responses, expedite incident clearance and make crash scenes safer. Read more in the latest issue of *Research & Technology Transporter* at http://www.tfhrc.gov/trnsptr/nov04/index.htm#its.

Software Zeros in on Driver Behavior

Understanding exactly what drivers are doing as they operate their vehicles is an important goal for ITS researchers. Researchers at the University of Minnesota's Department of Computer Science and Engineering have developed computer software that analyzes a series of images from a camera in the vehicle to determine the direction of the driver's gaze or whether the driver is using a particular vehicle control. Read more in *CTS Research E-News*. at http://www.cts.umn.edu/news/renews/10/index.html#monitoring.

Electronic Screening for Truck Safety

A small-scale field test in Connecticut showed that weigh station inspection selection systems can remove 2% more unsafe trucks from the roadway than traditional techniques for selecting trucks for inspection. A mathematical model estimated the impacts of this system nationwide and found that more than 4,000 truck crashes could be avoided each year if the enforcement technique were accompanied by a 10% increase in motor carrier safety compliance. See the ITS Benefits and Costs Database at http://www.benefitcost.its.dot.gov/ITS/benecost.nsf/ByLink/BOTM-December2004.

HNTB Boosts MoDOT's Gateway Guide

What began as a small component of an ITS design project for HNTB Corp. has quickly become a complete redesign of Missouri DOT's Gateway Guide communications system. The redesign converted the existing technology into a much more sophisticated, all-encompassing system tracking traffic views, vehicle speeds, traffic volume detectors and dynamic message signs. Read about the project on page 16 of HNTB's latest *Designer* magazine at http://newsroom.hntb.com/downloads/designer12-04.pdf, and visit the Gateway Guide site at http://www.gatewayguide.com/.

Drive Safe—Take a Power Nap

Awake Ltd., a British research consultancy linked to the Loughborough Sleep Research Centre, has released a new edition of Driver Reviver, a CD designed to be played during breaks from driving. The CD helps tired drivers take a 15-minute power nap and reawaken energized for safer driving. Research by LSRC for the Department for Transport indicates that power-napping is the most effective short-term countermeasure to driver tiredness. Read more at http://www.awakeltd.info/products/cd/index.html.

'Face' Lift for Roadway Signs

Inadequate signage can be a contributing factor in roadway crashes. FHWA has approved the interim use of a new typeface—Clearview—for signs on all public streets and highways. Developed by an interdisciplinary research team, Clearview achieves 20% greater legibility than its predecessor by using lowercase with initial capital letters, incorporating special spacing based on how a driver reads a sign from an extended distance, and minimizing nighttime overglow. See http://www.psu.edu/ur/2004/signs.html. Courtesy of the TRB E-Newsletter.